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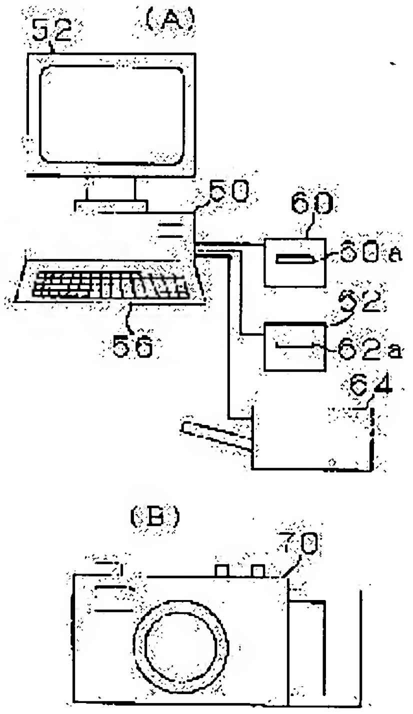
(54) IMAGE PROCESSING SYSTEM



(57)Abstract: PROBLEM TO BE SOLVED: To facilitate the arrangement of photographs photographed by a digital camera by retrieving coordinates, corresponding to each photograph of a photographic recording medium, from a travel locus recording medium, and displaying a photographic image in the coordinate position on a displayed map.

SOLUTION: A computer 50 takes in the travel locus (coordinates and passing time) of an on-vehicle navigation system from an RAM card through a card reader 60 and in succession takes in photographic data photographed by a digital camera 70 through a card reader 62. A map in a range of including the whole travel locus held in the RAM card is then displayed on a monitor 52. When a display area is selected by a frame, the map in that range is displayed, and photographs of the digital camera 70 photographed at the passing time and date of the travel locus in that range are extracted. Photographed position coordinates are retrieved on the basis of the time and date of each photograph, and these photographs are superimposed on the corresponding position coordinates on the map.

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] Especially this invention relates to the image processing system which can display the photograph taken with the camera of a daisy JITARU type in relation to the transit locus obtained by navigation equipment about an image processing system.
[0002]
[Description of the Prior Art] With the navigation equipment for mount, a GPS (claw BAL positioning system) receiver detects a self-vehicle location, a self-vehicle location is displayed on a monitor, and the course guidance to the destination is performed. Here, the thing of the method which displays a transit locus on this monitor is put in practical use by repeating a predetermined mark in the road [path] it passed.
[0003] The daisy JITARU camera held in memory by using the photoed image as daisy JITARU data is offered widely.
[0004]
[Problem(s) to be Solved by the Invention] However, a daisy JITARU camera has the thing in use photography of 100 or more sheets enabled it to perform to the upper limit of a film type being about 36 sheets on the need for differentiation with a film-type camera. Here, when photography time of day was memorized with an image and the photograph of a large number of 100 sheets in ** was taken, the technical problem that arrangement of a photograph became difficult occurred only at photography time of day.
[0005] The place which it is made in order that this invention may solve the technical problem mentioned above, and is made into the purpose is to offer the image processing system which can arrange easily the photograph taken with the daisy JITARU camera.
[0006]
[Means for Solving the Problem] In order to attain the above-mentioned purpose, the image processing system of claim 1 The location detection equipment which detects the position coordinate of a car, and the clock for measuring time of day, A display, the transit locus storage which memorizes a position coordinate and time of day, and the storage which associates the location and time of day which were detected by said location detection equipment, and is memorized to said transit locus storage, The photographic recording medium which holds the image of a photograph, and the time of day when this image was copied, respectively, A coordinate retrieval means to search the coordinate corresponding to the time of day of each photograph of said photographic recording medium from said transit locus record medium, an image display means to display the image of the photograph which related with the location held

at said transit locus record medium at said display, and was searched by said coordinate retrieval means -- since -- it makes to become into a technical feature.

[0007] In order to attain the above-mentioned purpose, moreover, the image processing system of claim 2 The transit locus record medium holding the transit locus which consists of a coordinate at the time of transit of a car, While displaying the map applicable to the transit locus held at said transit locus record medium at the photographic recording medium which holds the image of a photograph, and the coordinate with which this image was copied, respectively, the display for displaying a map, and said display an image display means to display in piles the image of the photograph of the coordinate concerned held at the photographic recording medium on the coordinate location on this map -- since -- it makes to become into a technical feature.

[0008]

[Function] With the configuration of claim 1, the transit locus which consists of the coordinate and passage time of day at the time of transit of a car is held at a transit locus record medium. On the other hand, the image of the photograph taken with the digital type camera and the time of day when this image was copied are held at a photographic recording medium. And a coordinate retrieval means searches the coordinate corresponding to the time of day of each photograph of a photographic recording medium from a transit locus record medium. And while an image display means relates with the location where said transit locus record medium was held at the display and displays a map, the photograph searched by said coordinate retrieval means is displayed on the coordinate location on this map.

[0009] With the configuration of claim 2, the transit locus which consists of the coordinate and passage time of day at the time of transit of a car is held at a transit locus record medium. On the other hand, the image of the photograph taken with the digital type camera equipped with the detection equipment of a coordinate location and the coordinate of the point where this image was copied are held at a photographic recording medium. In an image processing system, while an image display means displays the map applicable to the transit locus which holds the transit locus record medium to the display, the photograph of the coordinate concerned held at the photographic recording medium is displayed on the coordinate location on this map in piles.

[0010]

[Embodiment of the Invention] The embodiment of this invention is explained with reference to drawing below. Drawing 1 (A) is the block diagram showing the configuration of the navigation equipment for mount concerning one example of this invention. In this example, GPS receiver 18 is used as a measuring device of a self-vehicle location.

[0011] GPS receiver 18 computes a self-vehicle location by restoring to them and carrying out data processing of the data from the electric wave received by exclusive antenna 18a attached in the car. The computed self-vehicle location data are sent to CPU12. In addition, CPU12 adds amendment to positional information from GPS receiver 18 with the output from the gyroscope which is not illustrated and a speed sensor.

[0012] Data processing of the map is carried out at a predetermined format, and the coordinate of the north latitude and the east longitude and the map data which made it correspond are recorded on CDROM (not shown) with which the CDROM player 30 is loaded. The CDROM player 30 reproduces this CDROM, reads desired map data, and sends them to CPU12.

[0013] CPU12 makes required data read to the CDROM player 30. The map screen data created with the data read by this are written in VRAM24 through the graphic display controller (GDC) 22. GDC22 outputs the signal which reads the screen data which generate a display timing signal, and output to a monitor 28, and are memorized by VRAM24 while making VRAM24 memorize screen data. The output of the data read from VRAM24 is changed into the analog RGB signal by the pallet DAC 26, and is displayed as an image with a monitor 28.

[0014] ROM14 is the memory work habits (program) and fixed data of CPU12 were remembered to be. Moreover, RAM16 is working-level month memory used if needed, in case CPU12 advances various kinds of processings. An input unit 20 is equipped with the ten key for inputting the telephone number of the destination etc., when a user presses a key with a finger, is equipment which performs a setup and actuation of the destination of the navigation equipment for mount, and sends out the signal according to actuation to CPU12.

[0015] Storage 34 is loaded with possible RAM card 36 of the attachment and detachment to the throttle which is not illustrated. CPU12 holds the transit locus by memorizing a coordinate and time of day to this RAM card 36 through storage 34 for every predetermined time or predetermined mileage. A clock 32 detects current time and sends it to CPU12. Moreover, the receiver 38 is constituted so that the directions sent with infrared radiation from the remote control equipment 40 shown in drawing 1 (B) may be transmitted to the CPU12 side.

[0016] Remote control equipment 40 is equipped with the scrolling key 42 to which the cursor later mentioned on a monitor 28 as shown in drawing 1 (B) is moved, a click key 44, the image switch key 46, and the input keys 48a, 48b, 48c, and 48c that perform other inputs.

[0017] Here, processing by CPU12 of the navigation equipment for mount of this invention is explained with reference to the flow chart of drawing 2 . First, CPU12 detects the coordinate (north latitude and east longitude) of the current position based on the data from GPS receiver 18 (S12). And mileage is integrated based on the output from the HOIRU sensor which is not illustrated (S14). Then, it judges whether predetermined distance (here, it may be 1km) transit was carried out (S16). Here, whenever it runs 1km (S16 is Yes), a current coordinate and current time are memorized to RAM card 36 (S20). On the other hand, when having not carried out predetermined distance transit, (S16 judge whether they are No) and predetermined time of day (S18). Here, (S18 memorize a present coordinate and time of day to Yes) and RAM card 36 at predetermined time of day (every [for example,] minute) (S20).

[0018] Then, it judges whether the cursor key 42 of the remote control equipment 40 shown in drawing 1 (B) was operated (S22). Unless a cursor key 42 is operated (S22 is No), it judges whether the click key 44 was operated (S26). If a click key 42 is not operated (S26 is No), navigation processing will be performed through decision whether directions of an image switch were made (S30) (S32). Here, as shown in drawing 3 (A), while displaying a map including the current position on a monitor 28, the current position X of a self-vehicle is piled up on the map concerned along a travelling direction. Path guidance is performed by repeating the above processing, holding a transit locus.

[0019] Here, actuation of the cursor key 42 of the remote control equipment 40 shown in drawing 1 (B) moves the cursor Y on a monitor 28, as shown in drawing 3 (B) according to actuation of a click key 44 (S24). (S22 is Yes) And if a click key 44 is operated (S26 is Yes), RAM card 36 will be searched and it will ask for the coordinate (for example, north latitude 135:11:12 east longitude 35:21:44) and passage time of day (27-day PM 01:33) of a point which were specified with the cursor Y concerned, and as shown in drawing 3 (C), it will display.

[0020] On the other hand, if the image switch key 46 of the remote control equipment 40 shown in drawing 1 (B) is operated (S30), navigation processing will be interrupted temporarily and an image will be switched to the map chosen by the operator (S34). Then, the position coordinate and passage time of day of a point which were specified on the map image concerned are displayed like the processing mentioned above (S22-S28). Namely, although the coordinate and passage time of day of a point on a transit path were displayed in the map image under path guidance within the limits of the map currently displayed on the image concerned in the example which referred to drawing 3 (A) - drawing 3 (B) In case the past coordinate and the passage time of day of a passage location which are not displayed on this map are displayed, at step 30 and step 34, a map is made to be switched to that it ran in the past, and is performed.

[0021] Then, based on the transit locus held by processing mentioned above at RAM card 36, processing by the image processing system which arranges the photograph held at the RAM card (not shown) of the daisy JITARU camera 70 shown in drawing 4 (B) is explained with reference to drawing 4 thru/or drawing 8 . Here, moving with this car, the operator of the car with which the above-mentioned navigation equipment for mount was carried photos scenery etc. with the daisy JITARU camera 70, and gives the following explanation as what is reproduced and edited with the image processing system which shows the photograph of this daisy JITARU camera 70 to drawing 4 (A). In addition, it is collectively held by the photoed time at each photograph.

[0022] A monitor 52, a keyboard 56, the card read-out equipment 60 for reading the data of RAM card 36 of the navigation equipment for mount, the card read-out equipment 62 for reading the RAM card of the daisy JITARU camera 70, and a printer 64 are connected to the computer 50 of an image processing system. Here, throttle 60a of card read-out equipment 60 is loaded with RAM card 36 with which a transit locus and passage time of day were held by processing mentioned above with reference to drawing 2 , and throttle 62a of card read-out equipment 62 is loaded with the RAM card holding the photograph data photoed with the daisy JITARU camera 70.

[0023] Drawing 5 shows the flow chart of the image reconstruction and edit processing by the computer 50. The computer 50 holds map data almost equal to the map data based on CDROM of CDR0M player shown in drawing 1 . First, this computer incorporates the transit locus (a coordinate and passage time of day) of the navigation equipment for mount from RAM card 36 through card read-out equipment 60 (S42), and incorporates succeedingly the photograph data photoed with the daisy JITARU camera 70 through card read-out equipment 62 (S44). Then, the coordinate within the transit coordinate of the navigation equipment for mount of RAM card 36 most located in a northeast and the coordinate most located in southwest are extracted, and the map (map for selection of a viewing area) surrounded by these coordinates is displayed on a monitor 52 above, as shown in drawing 6 (A) (S46). That is, the map of the range which covers all the transit loci of the navigation equipment for mount currently held at RAM card 36 is displayed first.

[0024] Here, when an operator chooses a viewing area by frame 50a on the map shown in drawing 6 (A), it is displayed as shown to drawing 6 (B) in the map of the range where (S48 were surrounded by Yes) and the frame 50a concerned. On the other hand, when an operator specifies a travel corridor not under a frame (S48 is No) but under a date (S50 is Yes), a computer 50 extracts the coordinate in the path locus it ran on the date (for example, 27 days) concerned most located in a northeast, and the coordinate most located in southwest, and displays above the map surrounded by these coordinates on a monitor 52 (S54). In addition, not only one day but the thing for which two or more dates are chosen and the transit range over several days is specified is also possible for assignment of the transit range by the date.

[0025] A computer 50 extracts the photograph of the daisy JITARU camera 70 photoed in the passage time (here, suppose that it is PM12-PM4 on the 27th) of a transit locus which exists within limits currently displayed on the monitor 52 according to each time of the photograph concerned, when a display rectangle is specified by frame 50a at step 48 mentioned above (S53).

That is, the photograph taken while running the locus currently displayed on this monitor 52 is extracted. And the position coordinate photoed based on each time about each photograph is searched (S56), and to the position coordinate to which it corresponds on the map currently displayed, as shown in drawing 7 (C), a photograph is superimposed (S58). In addition, two or more photographs enable it to check each contents by shifting and displaying like illustration.
[0026] And as shown in drawing 7 (D), a specific photograph is specified by Cursor Y, and when migration is directed, (S60 move Yes) and the photograph concerned, as shown in drawing 7 (D) (S62). Moreover, when expansion of the photograph directed with Cursor Y is directed, (S64 expand the photograph concerned, as shown in Yes) and drawing 8 (E). In addition, although drawing 8 (E) shows the photograph expanded to the maximum, it can carry out zooming of the magnitude of each photograph continuously in this embodiment. Furthermore, when an alphabetic character is inputted through a keyboard 56, (S68 superimpose Yes) and the inputted alphabetic character, as shown in drawing 8 (F) (S70). And when print-out is directed by the operator, (S72 output by the printer 64 which shows the image which the edit on Yes) and a monitor 52 completed to drawing 4 (A). Edit processing of step 60 to the step 74 is repeated, and all processings will be completed if edit in alignment with a transit locus is completed (S76 is Yes).
[0027] According to this embodiment, a travel is taken by the car carrying the navigation equipment for mount shown in drawing 1 , and since a photograph can be edited on a transit locus while being able to perform arrangement of a photograph simply when a photograph is taken with the daisy JITARU camera 70 shown in drawing 4 (B), the so-called diary of a trip can be made easily.
[0028] then, this invention -- an image processing system [like] is explained the 2nd operative condition. Drawing 9 shows processing of this invention according the 2nd operative condition to the image processing system [like] to apply. In the 1st embodiment mentioned above, although the daisy JITARU camera 70 held time with the photograph, in this 2nd embodiment, the daisy JITARU camera 70 is equipped with a GPS receiver, and the coordinate of the location which took a photograph with the photograph is held. This data of the transit locus which also set like the 2nd operative condition and was recorded on RAM card 36 by the navigation equipment [like] for mount the 1st operative condition shall be used. In addition, the 2nd operative condition, since the mechanical configuration of an image processing system [like] is the same as that of the 1st embodiment mentioned above with reference to drawing 4 (A), illustration and explanation are omitted.
[0029] First, after incorporating the transit data of navigation ****** for mount from RAM card 36 (S42 shown in drawing 9) and incorporating photograph data (S47), the coordinate of the photograph taken at the point in photograph data most located in a northeast and the coordinate of the photograph most located in southwest are extracted (S49). And the map data which display the range surrounded by this northeast coordinate and the southwest coordinate are created (S51). Then, the position coordinate of each photograph is searched and the image data which compounded the image of a photograph to the applicable position coordinate on the map by this map data is created (S55), and as shown in drawing 7 (C), it displays (S57). Then, a photograph is edited like the 1st embodiment by processing of step 60 to the step 74.
[0030] In this 2nd embodiment, since the coordinate is held at the photograph side, when a photograph is continuously taken during transit of a car, there is an advantage which is easy to distinguish although each photograph took a photograph from which location path on the street.
[0031] In addition, although the transit locus was held to removable RAM card 36 with the

navigation equipment for mount mentioned above, it is also possible to hold this to internal RAM16. Furthermore, although the RAM card was used in the 1st and 2nd embodiment mentioned above as a storage of a transit locus, it cannot be overemphasized that various media, such as a floppy disk and a magneto-optic disk, can be used as a record medium.

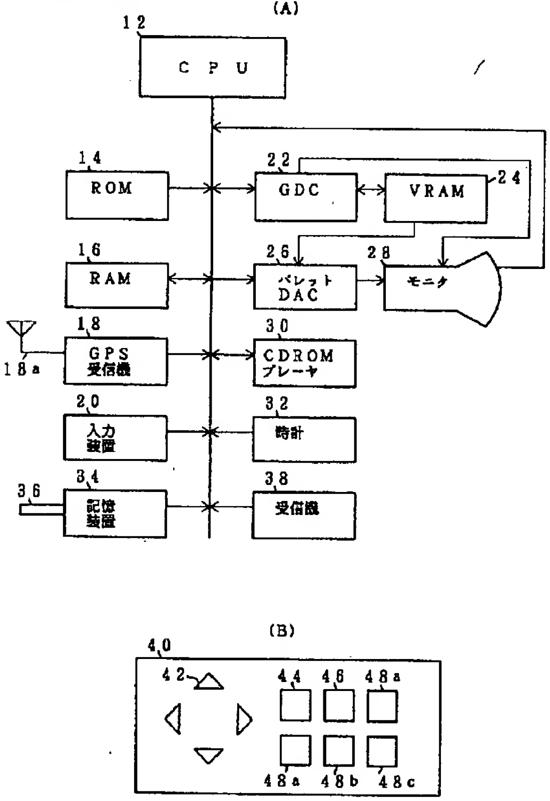
[0032]

[Effect] As described above, while being able to arrange easily the photograph of a large number photoed with the daisy JITARU camera according to the image processing system of this invention, it becomes possible to create simply the diary which compounded the photograph for the transit path.

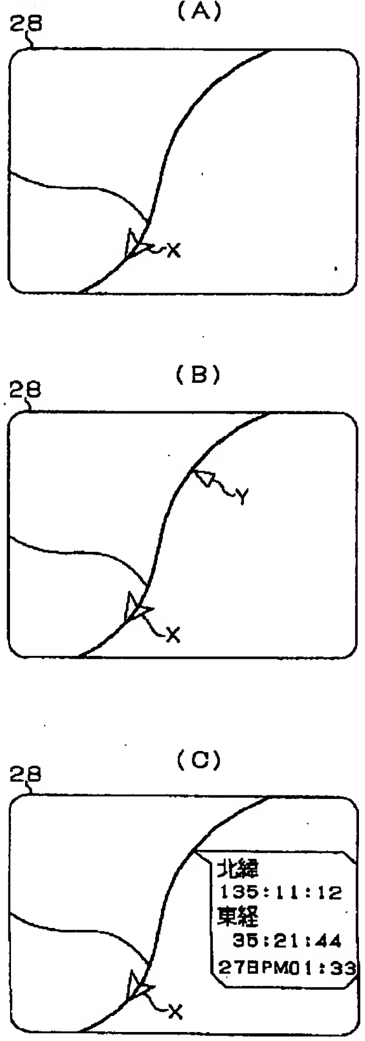
[Translation done.]

DRAWINGS

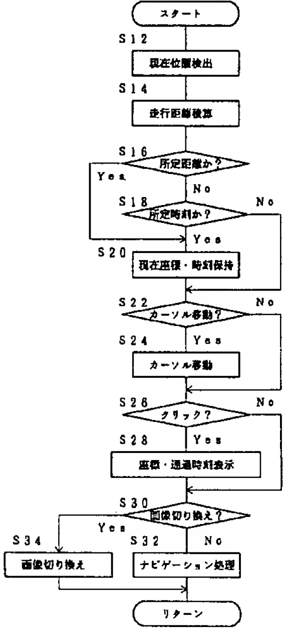
[Drawing 1]


(A)
12
CPU
14
ROM
22
GDC
VRAM
24
16
RAM
26
パレット DAC
28
モニタ
18
GPS 受信機
18a
30
CDROM プレーヤ
20
入力 装置
32
時計
36
34
記憶 装置
38
受信機
(B)
40
42
44
46
48a
48a
48b
48c

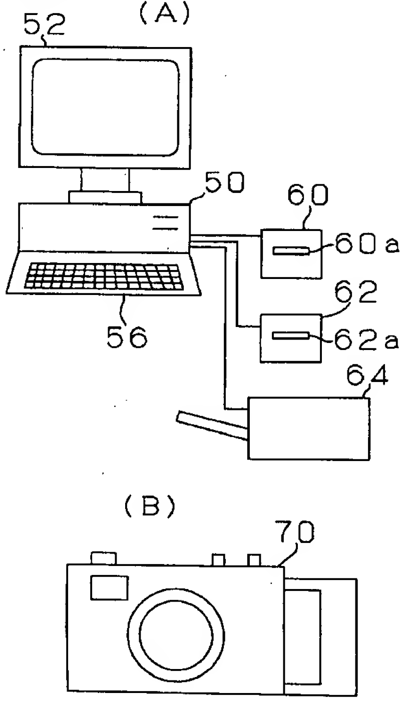
[Drawing 3]


(A)
28
X
(B)
28
Y
X
(C)
28
北緯
135:11:12
東経
35:21:44
27日PM01:33
X

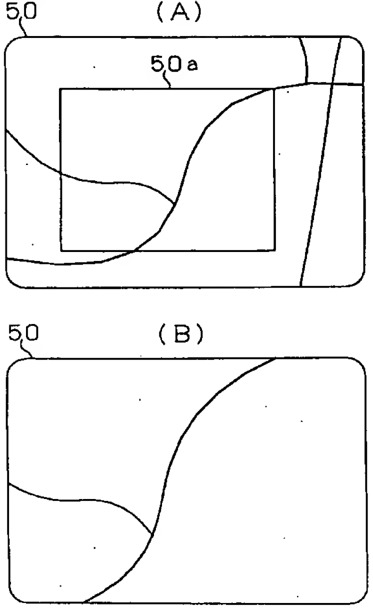
[Drawing 2]


スタート
S12
現在位置検出
S14
走行距離積算
S16
所定距離か？
Yes
No
S18
所定時刻か？
No
Yes
S20
現在座標・時刻保持
S22
カーソル移動？
No
S24
Yes
カーソル移動
S26
クリック？
No
S28
Yes
座標・通過時刻表示
S30
画像切り換え？
Yes
S34
S32
No
画像切り換え
ナビゲーション処理
リターン

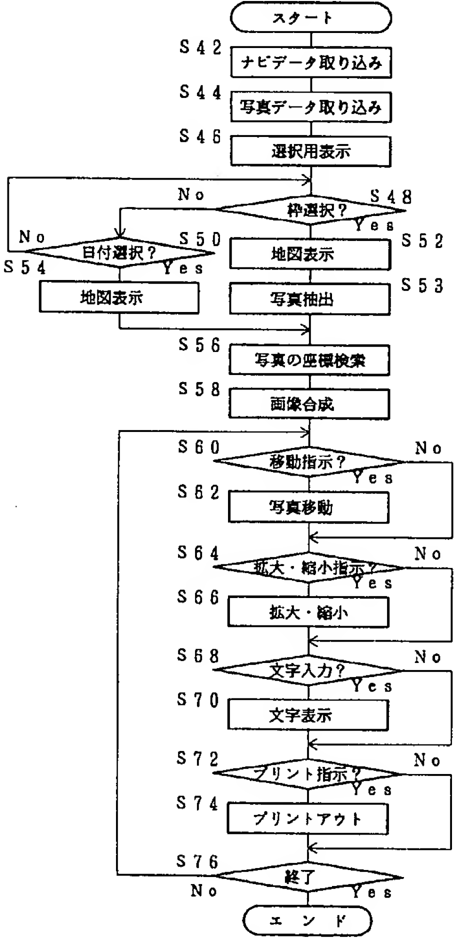
[Drawing 4]


(A)
52
50
60
60a
62
62a
64
56
(B)
70

[Drawing 6]

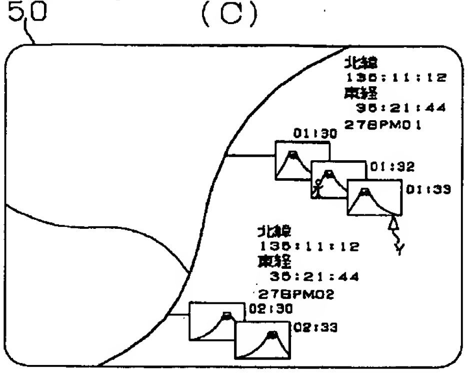


[Drawing 5]

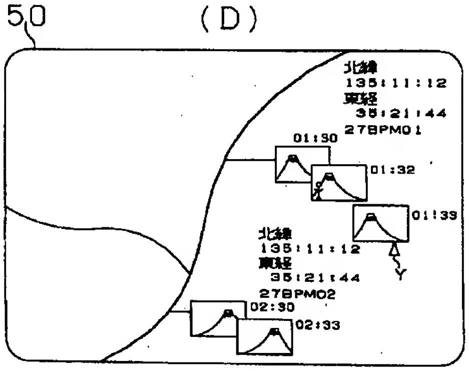

スタート
S42
ナビデータ取り込み
S44
写真データ取り込み
S46
選択用表示
No
S48
枠選択？
Yes
No
S50
日付選択？
Yes
S52
地図表示
S54
地図表示
S53
写真抽出
S56
写真の座標検索
S58
画像合成
S60
移動指示？
No
Yes
S62
写真移動
S64
拡大・縮小指示？
No
Yes
S66
拡大・縮小
S68
文字入力？
No
Yes
S70
文字表示
S72
プリント指示？
No
Yes
S74
プリントアウト
S76
終了
No
Yes
エンド

[Drawing 7]

(C)

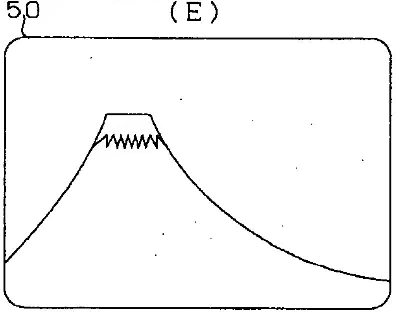

50
北緯
135:11:12
東経
35:21:44
278PM01
01:30
01:32
01:33
Y
北緯
135:11:12
東経
35:21:44
278PM02
02:30
02:33

(D)

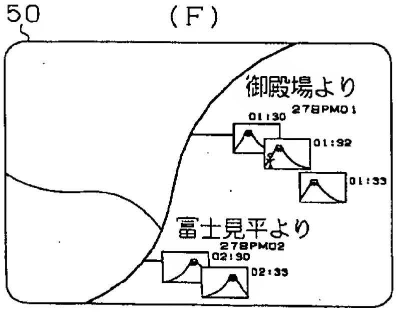

50
北緯
135:11:12
東経
35:21:44
278PM01
01:30
01:32
01:33
Y
北緯
135:11:12
東経
35:21:44
278PM02
02:30
02:33

[Drawing 8]

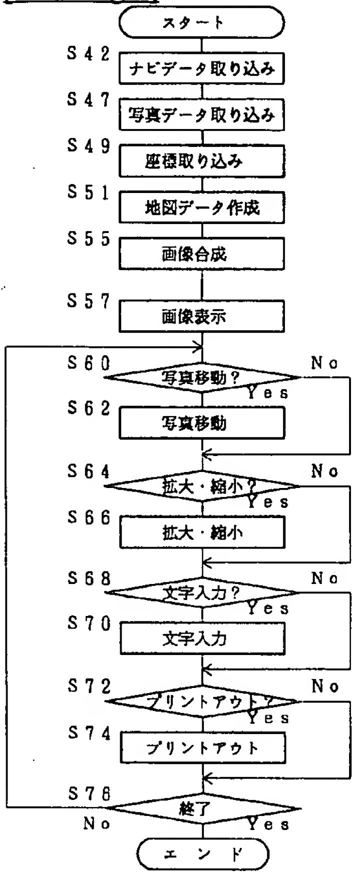
(E)



(F)


50
御殿場より
278PM01
01:30
01:32
01:33
富士見平より
278PM02
02:30
02:33

[Drawing 9]


スタート
S42
ナビデータ取り込み
S47
写真データ取り込み
S49
座標取り込み
S51
地図データ作成
S55
画像合成
S57
画像表示
S60
写真移動？
No
Yes
S62
写真移動
S64
拡大・縮小？
No
Yes
S66
拡大・縮小
S68
文字入力？
No
Yes
S70
文字入力
S72
プリントアウト？
No
Yes
S74
プリントアウト
S76
終了
No
Yes
エンド